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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/234,233	01/20/1999	WEIMIN LI	MI22-1035	6381

21567 7590 01/27/2003

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EXAMINER

VU, DAVID

ART UNIT	PAPER NUMBER
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2818

DATE MAILED: 01/27/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/234,233

Applicant(s)

LI ET AL.

Examiner

DAVID VU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7-13 and 16-18 is/are pending in the application.
- 4a) Of the above claim(s) 30 and 33 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-29 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☒ Claim(s) 5, 6, 14, 15, 19-21, 31 and 32 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 January 1999 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 27. 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 1, 10, 22 and 25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 1, 10, 22 and 25; the limitation of “depositing” and “as initially deposited” appears to be new subject matter which is not described in the original disclosure.

Any arguments regarding this “new matter” rejection should include the location in the original disclosure where the pertinent subject matter can be found.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another

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who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 10-13 and 18-20 are rejected under 35 U. S. C. 102(b) as being anticipated by Sachdev et al., (US 4,562,091).

Regarding claims 10-13 and 16-18, Sachdev et al., in related text (Col. 3, Line 42-Col. 4, Line 64) disclose a semiconductor processing method, comprising: forming a layer comprises carbon, silicon and oxygen over a substrate; some portions of the layer are exposed to energy while other portions are not exposed. The exposure to energy alters physical properties of the exposed portions relative to the unexposed portions. After the portions are exposed, the exposed and unexposed portions of the layer are subjected to common conditions. The common conditions are effective to remove the material and comprise a rate of removal that is influenced by the altered physical properties of the layer. The common conditions remove either the exposed or unexposed portions faster than the other of the exposed and unexposed portions, the selective removal of the exposed or unexposed portions, and while the other of the exposed and unexposed portions remains over the substrate.

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3. Claims 10-13 and 18-20 are rejected under 35 U. S. C. 102(e) as being anticipated by Leveriza et al., (US 4,764,247).

Regarding claims 10 and 16-18, Leveriza et al., in related text (Col. 1, Lines 25-55) disclose a semiconductor processing method, comprising: forming a layer comprises silicon and oxygen over a substrate; some portions of the layer are exposed to energy while other portions are not exposed. The exposure to energy alters physical properties of the exposed portions relative to the unexposed portions. After the portions are exposed, the exposed and unexposed portions of the layer are subjected to common conditions. The common conditions are effective to remove the material and comprise a rate of removal that is influenced by the altered physical properties of the layer. The common conditions remove either the exposed or unexposed portions faster than the other of the exposed and unexposed portions, the selective removal of the exposed or unexposed portions, and while the other of the exposed and unexposed portions remains over the substrate.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naik et al., (US 6,204,168) in view of S.Wolf et al. (Silicon Processing for the VLSI Era; Vol. 1-Process Technology, Prologue, Page xxiii)

Regarding claims 1-2, Naik et al., in related text (Col. 6, Lines 14-38) disclose a semiconductor processing method, comprising: forming a layer comprises silicon (PPMS) over a substrate; some portions of the layer are exposed to energy while other portions are not exposed. The exposure to energy alters physical properties of the exposed portions relative to the unexposed portions. After the portions are exposed, the exposed and unexposed portions of the layer are subjected to common conditions. The common conditions are effective to remove the material and comprise a rate of removal that is influenced by the altered physical properties of the layer. The common conditions remove the unexposed portions (PPMS), the selective removal of the unexposed portions (PPMS), and while the other of the exposed portions (PPMSO) remains over the substrate.

Naik et al. disclose all claimed subject matter, but fails to expressly disclose the step of cutting the wafer into separated die. Naik et al. disclose the above method at a substrate level. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the above process at a wafer level. S.Wolf et al. (Silicon Processing for the VLSI Era; Vol. 1-Process Technology, Prologue, Page xxiii) also disclose the step of cutting the wafer into separated die. It would have been obvious to one of ordinary skill in the art at the time the invention was made for dicing the wafer into separated chip as a step for fabrication of semiconductor devices, such as integrated circuits.

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5. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sachdev et al., (US 4,562,091) in view of S.Wolf et al. (Silicon Processing for the VLSI Era; Vol. 1-Process Technology, Prologue, Page xxiii)

Regarding claims 1-4, Sachdev et al., in related text (Col. 3, Line 42-Col. 4, Line 64) disclose a semiconductor processing method, comprising: forming a layer comprises carbon, silicon and oxygen over a substrate; some portions of the layer are exposed to energy while other portions are not exposed. The exposure to energy alters physical properties of the exposed portions relative to the unexposed portions. After the portions are exposed, the exposed and unexposed portions of the layer are subjected to common conditions. The common conditions are effective to remove the material and comprise a rate of removal that is influenced by the altered physical properties of the layer. The common conditions remove either the exposed or unexposed portions faster than the other of the exposed and unexposed portions, the selective removal of the exposed or unexposed portions, and while the other of the exposed and unexposed portions remains over the substrate.

Sachdev et al. disclose all claimed subject matter, but fails to expressly disclose the step of cutting the wafer into separated die. Sachdev et al. disclose the above method at a substrate level. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the above process at a wafer level. S.Wolf et al. (Silicon Processing for the VLSI Era; Vol. 1-Process Technology, Prologue, Page xxiii) also disclose the step of cutting the wafer into separated die. It would have been obvious to one of ordinary skill in the art at the time the invention was made for dicing

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the wafer into separated chip as a step for fabrication of semiconductor devices, such as integrated circuits.

6. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naik et al., (US 6,204,168) in view of S. Wolf et al. (Silicon Processing for the VLSI Era; Vol. 1- Process Technology, Prologue, Page xxiii) and furtherin view of Leveriza et al. (US 4,764,247).

Naik et al., disclose all claimed subject matter, but fails to expressly discloses the source of radiation. Leveriza et al., in related text, (Col. 1, Lines 25-30) disclose the energy in form of an electron beam, a UV light source, x-ray or plasma. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the energy in form of an electron beam, a UV light source, x-ray or plasma, since it has been held within the general skill of a worker in the art, to select a known source of radiation on the basis of its suitability for its intended use is a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Allowable Subject Matter

7. Claims 5-6, 14-15, 19-21 and 31-32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claims 22-29 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, first paragraph, set forth in this Office action.

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The following is a statement of reasons for the indication of allowable subject matter: None of the references of record teaches or suggested the material comprising Si(OH)_4 or $(\text{CH}_3)_y\text{Si(OH)}_{4-y}$ are using for the photoresist material in the above process.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (703) 305-0391. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms., can be reached on (703) 308-4910.

DV
David Vu.


David Nelms
Supervisory Patent Examiner
Technology Center 2800